

CLAIMS

1. (Currently amended) Apparatus for converting between analogue and digital signals comprising:

a continuous-time sigma-delta modulator; and

clock pulse generator apparatus for generating a train of return-to zero clock pulses each having leading and trailing edges defining alternately an active clock phase and a non-active clock phase, said clock pulse generator apparatus comprising:

~~a clock pulse generator for generating an input for receiving a train of return to zero primary first~~ clock pulses each having leading and trailing edges ~~defining alternately an active clock phase and a non-active clock phase;~~

a delay module for producing a train of delayed clock pulses presenting delayed edges whose timing relative to corresponding edges of said ~~primary first~~ clock pulses is defined by said delay module, and

a combiner for producing ~~a said train of return-to-zero combined~~ clock pulses presenting leading and trailing edges defined alternately by one of said delayed edges and ~~the said corresponding edge edges of the primary said first~~ clock ~~pulsepulses~~, so that the active clock phases of said return-to-zero combined clock pulses have widths defined by said delay module, the variability of said widths of said active clock phases being smaller than the variability of the positions of said leading and trailing edges of said ~~primary first~~ clock pulses, and the widths of said non-active clock phases varying as a function of variation in the positions of said ~~primary first~~ clock pulses;

said continuous-time sigma-delta modulator being connected to said combiner to utilize said train of ~~combined~~ return-to-zero clock pulses as clock.

2. (Previously presented) Apparatus for converting between analogue and digital signals as claimed in claim 1 wherein said delay module comprises at least a first series of cascaded,

substantially identical delay elements for producing said train of delayed clock pulses with a delay defined by said first series of delay elements.

3. (Currently amended) Apparatus for converting between analogue and digital signals as claimed in claim 2 wherein said delay module comprises a further series of cascaded delay elements which are substantially identical to said delay elements of said first series for producing a further train of delayed clock pulses with a delay relative to said train of first clock pulses defined by said further series of delay elements, an adjustment element responsive to ~~the~~ said delay of said further ~~series~~ train of delayed clock pulses ~~series~~ relative to said train of ~~primary~~ first clock pulses for applying an adjustment signal to tend to correct the delay of said further train of delayed clock pulses, said adjustment signal being averaged over a plurality of clock periods of said train of first clock pulses, and said adjustment signal being arranged to adjust the delay defined by said first series of delay elements.
4. (Currently amended) Apparatus for converting between analogue and digital signals as claimed in claim 2 wherein each of said substantially identical delay elements comprises a respective capacitive element, a current supply responsive to ~~an~~ a signal input to the delay element for supplying a controlled current to said respective capacitive element, and trigger means responsive to the voltage at said respective capacitive element.
5. (Previously presented) Apparatus for converting between analogue and digital signals as claimed in claim 1, wherein said continuous-time sigma-delta modulator comprises an integrator for integrating a signal over periods of time defined by said widths of said active clock phases.
6. (Currently amended) Apparatus for converting between analogue and digital signals as claimed in claim ~~5~~1, wherein said continuous-time sigma-delta modulator comprises a digital-to-analogue converter module whose operation is responsive to said train of ~~combined~~ return-to-zero clock pulses.
7. (Currently amended) Apparatus for converting ~~an~~ between analogue ~~signal to a~~ and digital ~~signal~~ signals as claimed in claim 6, wherein said continuous-time sigma-delta modulator

comprises an input for receiving said analogue signal, an output for said digital signal and a feedback loop from said output including said digital-to-analogue converter module.

8. (Currently amended) Apparatus for converting ~~a digital signal to an~~ between analogue signal and digital signals as claimed in claim 6, wherein said continuous-time sigma-delta modulator comprises an input for receiving said digital signal and an output for said analogue signal, said digital-to-analogue module being in series between said input and said output.